THE

GREEN MOUNTAIN REPOSITORY.

VOL. I. BURLINGTON, SEPTEMBER, 1832. NO. 9.

Principally from Dr Ware's Introduction to Smellie's Philosophy.

CLASSIFICATION OF ANIMALS.

In order to treat clearly of the animal kingdom, it is necessary to consider it according to some method of arrangement, by which those animals that most resemble one another are connected together, for the convenience of description. This arrangement is founded upon their form and structure, and separates them into various divisions and subdivisions according to their degree of similarity, and the points in which their structures correspond. Such a system of arrangement is called a Classification of the Animal Kingdom.

In surveying the long series of animals, from the lowest and most insignificant worm, up to man, the lord of the creation, and examining the structure of their bodies, and the mode in which they are enabled to carry on the functions of life, we observe certain lines of distinction among them, which afford ground for arranging them, in the first place, in two grand divisions. Those of the first grand division are possessed of an internal skeleton, a system of bones covered by the flesh, which serves to give form, support, and strength to their whole fabric, and to assist in containing the various internal organs, whose actions serve to keep up the life and vigor of the system. Those of the second, are not possessed of any such skeleton, but consist of a collection of organs more or less distinct, without any solid basis, and are generally of a soft, yielding texture, though occasionally covered and protected externally by a shell or other hard covering. We observe farther, that in animals of the first kind, the blood is always red; in those of the second kind, it is, with few a exceptions, white.

In those of the first kind, there is always a bony case, called the *cranium* or skull, which contains the brain; and a number of bones, called vertebræ, connected together, so as to form a long column, usually called the spine, the back bone, or the vertebral column. This column contains a canal extending its whole length, which receives the spinal nerve or marrow, as it passes out of the skull, and conveys it along the trunk, to be from thence distributed to the various parts of the body. It is as it were the main pillar or common support of all the rest of the skeleton; and hence the animals possessed of it are called VERTEBRAL animals, as this forms the most striking characteristic which is common to them all.

In animals of the second kind, there is no skeleton, and of course no vertebral column. The brain and nervous system are not therefore protected by any bony covering. These organs do not resemble the corresponding ones of the vertebral animals, but are less distinct and apparently less important. They have not many common points of resemblance, but as they none of them possess a back-bone or a skeleton, they are denominated from this circumstance INVERTEBRAL animals, i. e. without vertebræ.

The two first grand divisions of the animal kingdom, then, are 1. VERTEBRAL, such as man, quadrupeds, birds, fishes, &c. having a skeleton and red blood; and, 2. INVERTEBRAL, such as worms, insects, shell-fish, &c. having no skeleton and white blood.

But in examining the first division, we find farther differences. Man, quadrupeds, whales, and birds, have all a temperature above that of the air or water in which they reside. Their flesh is warm, and as this warmth is supposed to depend upon the temperature of the blood, we call them *warm-blooded*. On the other hand, frogs, toads, lizards, serpents, and fishes, have all a temperature varying but little from that of the air or water in which they live. They impart to us, when we touch them, the sensation of cold. Hence we call them *cold-blooded*. Here then is afforded ground for a subdivision of the vertebral animals into the warm-blooded and the cold-blooded.

Again, the warm-blooded animals are capable of being divided into two classes. A part of them produce their young alive, nourish them during infancy by their own milk, from organs called their mammæ, or breasts, and are hence called *mammalia* or *mammiferous* animals. This class includes man, quadrupeds, whales, porpoises,

&c. Another part produce their young by means of eggs, which they hatch by the heat of their bodies, and support by food which they provide for them as soon as they come out of the egg. This class includes birds.

The cold-blooded vertebral animals form three classes. The two first contain those which breathe only pure air, and cannot exist without it, as serpents, reptiles, &c. The third contains those which breathe by gills or branchiæ, through the medium of the water. This class includes all the true fishes; for the cetaceous animals, mentioned above, are not, strictly speaking, to be numbered among fishes.

The invertebral animals are not capable of so satisfactory and accurate an arrangement. Their structure is not yet sufficiently understood; but they may be divided into five classes, according to such circumstances of resemblance as the present state of knowledge with regard to them admits. These classes are 1. Crustacea, as the lobster, crab, and craw-fish. 2. Insects. 3. Mollusca, as the oyster, the snail, the cuttle-fish or squid, the clam, and the quahog. 4. Vermes or worms, as the earthworm, the leech. 5. Zoophytes, as the star-fish, the sea-urchin, the sea-anemone, the sun-fish, the polypes, the sponges, and the animalcules.

Tabular view of the Classes.

VERTEBRAL ANIMALS.

Having an internal, long or cartilaginous skeleton, and brain.	A double heart and warm blood.	Viviparous, with *mammæ*,	I. Mammalia.
		Oviparous, without *mammæ*,	II. Birds.
	A single heart and cold blood.	Lungs and articulated members,	III. Reptiles.
		Lungs with no articulated members,	IV. Serpents.
		Having gills and fins,	V. Fishes.

INVERTEBRAL ANIMALS.

Having no internal skeleton and no brain.	With articulated members.	A circulating system and gills,	VI. Crustacea.
		No circulating system and trachiæ,	VII. Insects.
	Without articulated members.	Having simple nerves,	VIII. Mollusca.
		Having knotted nerves,	IX. Worms.
		Having no nervous system,	X. Zoophytes.

Classes are subdivided into a greater or less number of orders; and these are distinguished by some important, clear, and remarkable peculiarities of confirmation and structure, which are common to all the animals included under each of them. Thus, in the class Mammalia, the order Quadrumana includes those animals which have hands upon all four of their extremities, such as monkies and apes; the order Ruminantia, those which ruminate or chew the cud; the order Carnivora, those adapted to feed principally on

animal food. In the other classes, the divisions are of a similar kind.

ORDERS are subdivided into GENERA. These comprehend animals which have a gereral external resemblance to each other, a kind of family likeness. Thus the genus Felis includes all those of the cat kind; and these animals, although differing one from another very much in size and colour, have yet a very close resemblance in their general form, figure, character, and habits of life. The genus Canis includes those of the dog kind; the wolf, the fox, the jackal, and the domestic dog, of which the same remark may be made. Thus too the horse, the ass, the zebra, are all of the same genus Equus, on account of their obvious general similarity.

Again, GENERA are made up of SPECIES. Each distinct kind of animal constitutes a species, and they are known from one another by their size, colour, form and various other circumstances of external appearance. There are then as many species as their are sorts of animals. Thus the cat is one species, the tiger is another, and the lion, leopard, jaguar, and catamount are also separate species; but taken together with others, they constitute the genus Felis. Thus too the genus Canis contains the dog, the wolf, the jackal, and the fox, which are all so many distinct species. The genus Sciurus contains the grey, red, striped, and several other kinds of squirrels. In treating of any particular animal, naturalists are accustomed to designate it by a name derived from its genus and species. This name is composed of two words: the first being the name of its genus; and the second being either altogether arbitrary, or else expressing some circumstance relating to the colour, size, or residence of the animal, which serves in a degree to distinguish it from others. The first is called its generic, the second its trivial or specific name, and they correspond very closely to the names of human individuals; the generic terms answering to the *sirname* which designates the family to which any one belongs, and the trivial to the *christian* name which designates the particular individual.

To give an example; the different species of the genus Felis, above mentioned, are distinguished one from another in the following manner. The lion is called Felis leo; the tiger, Felis trgris; the leopard, Felis leopardus; the jaguar, Felis onca; the lynx,

Felis lynx; the serval, Felis serval, &c. In the genus Canis, the dog is called Canis domesticus; the wolf Canis lupus; the black wolf, Canis lycaon; the fox, Canis vulpes, &c. In this way, each animal is capable of being clearly and accurately designated, by a name which is not so liable to mistake and confusion as its common one, which is sometimes applied to several different species. This is called the scientific or systematic name.

Each kind of animal, then, constitutes a distinct SPECIES; a number of species taken together form a GENUS; those genera which have important and well defined points of resemblance in structure and conformation, common to all, are placed together in an ORDER; whilst upon a similar principle, but more extensive in its application, these orders are marshalled into separate CLASSES.

THE CAT BIRD.

(*Turdus felivox*, VIEILL. *Turdus lividus*, WILSON.)

This quaint and familiar songster probably passes the winter in the southern extremities of the United States and along the coast of Mexico, from whence, as early as February, they arrive in Georgia. About the middle of April they are first seen in Pennsylvania, and at length leisurely approach this part of New-England, by the close of the first or beginning of the second week in May. They continue their migration also to Canada; but whether they proceed into the desolate arctic wilderness or not, we are

ignorant. They are said, however, to inhabit Kamtschatka, and consequently penetrate very far to the north. Throughout this extent, and to the territory of the Mississippi, they likewise pass the period of incubation and rearing their young. They remain in New England till about the middle of October, at which time the young feed principally upon wild berries.

The cat bird often tunes his cheerful song before the break of day, hopping from bush to bush, with great agility, after his insect prey, while yet scarcely distinguishable amidst the dusky shadows of the dawn. The notes of different individuals vary considerably, so that some times his song, in sweetness and compass, is scarcely at all inferior to that of the Ferruginous thrush. A quaintness, however, prevails in all his efforts, and his song is frequently made up of short and blended imitations of other birds, given, however, with great emphasis, melody, and variety of tone; and, like the nightingale, invading the hours of repose, in the late twilight of a summer's evening, when scarce another note is heard but the hum of the drowsy beetle, his music attains its full effect, and often rises and falls with all the swell and studied cadence of finished harmony. During the heat of the day, or late in the morning, the variety of his song declines, or he pursues his employment in silence and retirement.

One of the most remarkable propensities of the cat bird, and to which it owes its name, is the unpleasant, loud and grating cat-like *mew (pay, pay, pay)* which it often utters, on being approached or offended. As the irritation increases, this note becomes more hoarse, reiterated and vehement; and sometimes this petulence and anger are carried so far, as to persecute every intruder who approaches the premises. This temper often prevails after the young are fledged, and though originating, no doubt, in parental anxiety, it sometimes appears to outlive that season, and occasionally becomes such an annoyance, that a revengeful and fatal blow from a stick or stone, is but too often, with the thoughtless and prejudiced, the reward of this harmless and capricious provocation. At such times, with little apparent cause, the agitation of the bird is excessive; she hurries backward and forward, with hanging wings, and open mouth, mewing and screaming in a paroxysm of scolding anger, and alighting almost to peck the very hand that offers the insult. To touch a twig or branch in any part of the

garden or wood is often amply sufficeint to call down the amusing termagant. This harmless excess, and simulation of grimalkin's tone, the wizard animal, so much disliked by many, are unfortunate associations in the cry of the *cat* bird; and thus coupled with an ill name, this delightful and familiar songster, who seeks out the very society of man, and reposes an unmerited confidence in his protection, is treated with undeserved obloquy and contempt. The flight of the cat bird is laborious, and usually continued only from bush to bush; his progress, however, is very wily, and his attitudes and jerks amusingly capricious. He appears to have very little fear of enemies, often descends to the ground in quest of insects, and though almost familiar, is very quick in his retreat from real danger.

This common and abundant species begins to construct its nest some time in the month of May. The situation in which he delights to dwell, is commonly a dark thicket, in the woods, or close bush in some recluse part of the garden, at the distance of five or ten feet from the ground, according to the convenience of the situation. The materials are coarse but substantial; the external part is commonly made of small interlaced twigs, old grass and dry leaves; to these succeed thin strips of bark, often of the red ceder, somewhat agglutinated. The inside is lined and bedded with black root fibres of ferns; other accidental materials sometimes make a fantastic part of the fabric. One has been known to carry away an edging of lace which was missed, and at length again recovered after the rearing of the brood, whose dainty bed it assisted to form. I have frequently found in the external coat of the nest, the cast off skins of *snakes*, more rarely bits of newspapers, wood shavings, strings, and bass-mat strips. The eggs are four or five, of a bright and deep emerald green, and without spots. According to the time of their arrival they raise two or even three broods in the season. The cat bird is not easily induced to forsake its nest. Wilson removed one containing four eggs, nearly hatched, from a grape vine into a thicket of briars close by, which was soon occupied by the female, as if nothing had happened to it. Other birds' eggs, those of the thrasher, and young of the same species, were instantly turned out of the nest in which they had been placed. Yet the male, divesting himself of selfish jealousy, observing the distress and helplessness of the young thus dislodged

by his mate, began to feed them as his own. Their sagacity is therefore superior to that of the ordinary thrushes, as the *Turdus Wilsonii* is even one of the duped nurses occasionally employed by the cow bird.

The food of the cat bird is insects and worms, particularly beetles, and various garden fruits; feeding its young often on cherries, and other kinds of fruits. Sometimes they are observed to attack snakes when they approach the vicinity of their brood, and commonly succeed in driving off the enemy; when bitten, however, by the poisonous kinds, it is probable as related, that they may act in such a manner, as to appear laboring under the influence of fascination. The cat bird, when raised from the nest, is easily domesticated, becomes a very amusing inmate, and seems attached to his cage, as to a dwelling or place of security. About dawn of day, if at large, he flies about with affected wildness, repeatedly jerks his tail and wings with the noise almost of a whip, and stretching forth his head, opens his mouth and mews. Sometimes this curious cry is so gutteral as to be uttered without opening the bill. He often also gives a squeal as he flies from one place to another; and is very tame, though pugnacious to all other birds which approach him for injury. When wanting food, he stirs round with great uneasiness, jerks every thing about within his reach, and utters the feeble cry of the caged mocking bird. A very amusing individual, which I now describe, began his vocal powers by imitating the sweet and low warble of the song sparrow, as given in the autumn; and, from his love of imitation on other occasions, I am inclined to believe that he possesses no original note of his own, but acquires and modulates the songs of other birds. Like the robin, he is exceedingly fond of washing, and dashes about in the water till every feather appears drenched; he also, at times, basks in the gravel in fine weather. His food, in confinement, is almost every thing vegetable, except unbruised seeds; as bread, fine pastry, cakes, scalded corn-meal, fruits, particularly those which are juicy, and now and then insects and minced flesh.

The length of this species is about nine inches. Above deep slate color, lightest on the edges of the primaries, and also considerably paler below. The under tail coverts reddish chestnut. Tail rounded. Upper part of the head, legs and bill, black. It occurs

rarely pye-bald, with the head and back white, being nearly an albino. *Nuttall's Ornithology*

STEAM CARRIAGE.

A London paper speaking of an experiment made with a steam-carriage on a common road, which was successful, says:

The inventor of the new engine is a Mr Walter Hancock, of Stratford, who was attended by several scientific gentlemen from London, sixteen of whom took seats in the cars in front. The carriage, guided by Mr Hancock in front, was put in motion by his turning a lever connected with the steam coach of the boiler, and proceeded through Stratford, up the hill, to the Green Man, on the Forest, at the steady pace of eight miles an hour. He then turned short, and returned to the factory within forty minutes, after running about seven miles in the pleasantest manner, and with a perfect sense of security to every one in the carriage. In fact, the experiment was successful, and we may henceforward look to the rapid introduction of a safe and greatly improved mode of travelling, leading to a very important revolution in the domestic economy of nations. The carriage in question has two bodies for sixteen passengers, and two seats for outside ones. This double body occupies a length of ten feet, and the engine house and apparatus about eight feet in the rear. The quantity of fuel consumed during this trip was about 2½ bushels of coke, the fire being fed behind. The stock of water converted into steam was about three barrels, or 100 gallons. The height of the vehicle is nine feet, and it stands three feet eight inches from the ground. The boiler is of the description called tubular, and in this engine it consists of twelve chambers, each distinct, and formed of the best charcoal iron, so that no explosion is probable, and if any took place, it could be only one of the chambers, and consequential. This carriage is built for the Greenwich road, it will perform that journey in half an hour. The facility of stopping is perfect, and its traverses on a crowded road are effected with a far greater surety than in any carriages drawn even by the best trained horses. It turns in the shortest compass, and, in fact, possesses all the best qualities of a modern built carriage. Other carriages, with

omnibus bodies, to carry fourteen passengers, are now building, of somewhat lighter construction, which are intended to travel about twelve miles an hour. As the engine is placed in the rear of the carriage, and the boiler and fire at the extremity, no inconvenience is experienced by the passengers from noise, or smoke, and the sensation is precisely that of travelling in any other carriage.

For the Green Mountain Repository.

CLIMATE AND TEMPERATURE.

Since the sun is the great source of light and heat to our globe, and since the sun's influence is greatest at the equator, and gradually diminishes, as we approach the poles, where it is least, we might be led to conclude, that climate and temperature were wholly regulated by latitude. But this is very far from being the fact.—Places lying in the same latitude, not only on different sides of the equator, but on the same side, are found to differ very considerably in climate. But the cause of this difference is usually apparent in the local circumstances.

The local circumstances, which most materially affect the temperature of places, besides the direction and duration of the sun's rays, are, evaporation, the direction of the prevailing winds, the elevation of the place above the level of the sea, the position and altitude of the neighboring mountains, and especially the proximity of large bodies of water.

It is found by observation that the variations of temperature which our atmosphere experiences, are mostly produced at, or very near, the earth's surface. The atmosphere, when clear, is but little, if at all, heated by the direct rays of the sun. This is evident from experiments made with a burning glass, and from the fact that the tops of high mountains, which are seldom sheltered by clouds from the sun's rays, are bound in eternal frost, and covered with snow and ice. We have to ascend only three miles above the level of the sea, in the warmest climates, to arrive at the region of perpetual frost; and this height diminishes as we approach the poles. The summits of the Andes, under a vertical sun, are suffering all the inclemencies of a polar winter, while the plains of Quito are covered with the luxuriance and beauty of spring, and the low coun-

tries of Peru are parched by the intense heat of a tropical summer. We have something similar to this in our own neighborhood. Winter is known to continue upon the Green Mountains in this State, until vegetation is considerably advanced in the adjacent vallies. The peach tree has been seen in full bloom at Bennington, when the snow was several feet deep on the mountains not six miles off. They who have ascended in balloons, all give their testimony to the coldness of the upper regions of atmosphere. The celebrated aeronaut (ā' ur o not) Mr Sadler, in crossing the Irish channel in a balloon, in July, 1828, found himself for some time involved in a tedious snow storm. The height of perpetual frost above the level of the sea, in our latitude, is about 8000 feet, and the highest lands in the United States are the White Mountains in New-Hampshire, the highest peak of which is only 6634 feet above the level of the sea; we have, therefore, no mountains which rise into the region of perpetual frost.

Now it is a well known fact, that although the heat be communicated to the lowest parts of the atmosphere, the warm air will rise upwards in consequence of its being heated, and if we examine the temperature of the air in our apartments, it will be found that the highest parts of it are warmest. But, if it is the tendency of warm air to ascend, while the colder air sinks downward to supply its place, why should not the upper regions of the atmosphere be warmest, as well as the upper stratum of air in our apartments? I think it must be acknowledged to be somewhat difficult to give a satisfactory answer to this question. But since the atmosphere is known to diminish very rapidly in density as we ascend, we are undoubtedly to look for the cause of the diminution of temperature in the higher regions of the atmosphere, in the increased capacity for specific heat, in consequence of the expansion.

I have mentioned evaporation as an agent in affecting temperature. This, as we learn from Chemistry, and as we perhaps all know from experience, is an important agent in the production of cold, and to this cause are we probably to look for the change of climate in America since our ancestors first landed upon its shores. It is found by experiment, that lands covered with forests and luxuriant vegetation, throw off into the atmosphere a much larger quantity of vapor, in the summer, than cultivated lands, or even water itself. If, then, the climate of New-England has been grow-

ing milder since its settlement, are we not justified in ascribing the change to the clearing and cultivating of the lands by which the quantity of evaporation is diminished? It is also obvious from these circumstances, why we have less water fall now, in snow and rain, than we formerly had. And, having less water fall upon the surface of the ground, the reason is apparent why our streams have diminished in size since the country was cleared. But I would here remark, that the quantity of water which passes off in our streams is not so much less than formerly as many may imagine. When the country was new, the waters which fell from the clouds were detained upon the surface of the ground by the leaves and logs, and found their way into the channels but slowly, and hence the streams would be augmented by a fall of rain for a considerable time, but would not rise very high. But now these obstructions are mostly removed,—the waters run off rapidly from the surface of the ground into the channels,—the streams are suddenly augmented, rise to a great height, and for a little while sweap all before them.—They then subside, and, being supplied only by the springs, appear to be diminished in size, or smaller than they ever were in former times.

I have said that the climate of places is effected by being in the neighborhood of large bodies of water. Hence it is that the climate of the sea shores and of islands, is invariably found to be milder than the interior parts of continents in the same latitude. When the sun shines upon the surface of the ground, the heat penetrates but a little distance, and the surface and air over it is, consequently, considerably heated; but in the absence of the sun, this surface is soon cooled down by radiation and other means, so as to communicate but little or no heat to the air above it. But it is different with water. When the sun's rays fall upon the ocean, they penetrate to a considerable depth, and the heat is diffused through a large mass of water. Hence the surface is not suddenly heated in the presence of the sun, nor, in consequence of the manner in which heat is propagated in fluids, is it immediately cooled in his absence.

The greatest diversity between the temperature of countries lying in the same latitude is found to exist between the eastern coasts of North America and the western shores of Europe. It is well ascertained that the climate of the United States in latitude 40 is as

cold as that of Europe in latitude 50 degrees. A similar difference, though much less, is observed between the eastern coasts of Asia, and the western shores of North America. The cause of a diversity so striking must be an interesting object of inquiry. But I think we shall find little trouble in discovering it, in the combined influence of the prevailing winds and the currents of the ocean. Westerly winds are known to be most prevalent in the temperate zones, and especially much the most so on the western coasts of Europe, and the temperature of the winds will be regulated by the surface over which they pass. Now when cold winds come from the mountainous regions of the interior of our continent, their rigour will be abated, until the temperature of the surface of the earth is brought down to the temperature of the air, which will soon be affected, after which they will pass over it with all their intensity. But these winds in their passage over the Atlantic will have their temperature considerably elevated by the heat which they derive from the waters, and will therefore be much warmer when they arrive upon the coasts of Europe than they were, when they left the coasts of America, and on account of the great depth and width of the Atlantic and the constant supply of warm water from the south the temperature of the ocean will be but little diminished. Like observations will apply to the influence of the Pacific upon the winds which blow from Asia over to the western coasts of America. The greater difference between the temperature of the United States and Europe and that of the eastern parts of Asia, and the western parts of America is owing in some degree to the superior width of the Atlantic towards the north, but principally to the influence of currents in the ocean.

The manner in which fluids are heated and cooled by the internal motion of their particles, and the reversion of the general law, that bodies are expanded by heat and contracted by being cooled, which takes place in water at the temperature of 40 degrees, and which are explained and illustrated in Chemistry, are most signal dispensations of providence for the equalization of temperature, and for the preservation of our rivers and lakes during the winter in a fluid state. When a cold wind blows over a body of fresh water it deprives the surface of a portion of its heat. The upper stratum therefore contracts, becomes specifically heavier than the waters below, and therefore descends

and forces the warmer water upwards to the surface. This is also displaced in its turn, and thus the circulation continues until the whole mass of waters is brought down to the temperature of 40 degrees, or within 8 degrees of the point of freezing. The circulation then ceases and the surface is consequently soon cooled down to 32 degrees and becomes frozen, while the temperature of the water below remains at 40 degrees, and is thus preserved in a fluid state during the winter. Now it is obvious that if the general law of contraction had been observed in this case, no ice could have been formed until the temperature of all the water was reduced to the freezing point, and then the ice, as fast as formed, would sink to the bottom, and in this way our lakes might be converted into solid ice, which the heat of summer would be insufficient to dissolve, and whose refrigerating influence would render their now fertile shores as barren and desolate as the regions within the arctic circle.

The influence of lakes in tempering the heat of summer and the great superiority of fresh water lakes over those which are salt, in rendering the climate mild in their vicinity has not, I think, been duly regarded by writers on climate and physical geography. It is easily shown that if our lakes were salt, our summers would be much colder and more backward, while the severity of our winters would be but little abated. A fresh water lake is soon frozen over and its waters are preserved during the winter at the temperature of 40 degrees, and the winds pass over it as over land without being warmed. But the addition of a few degrees of cold during the winter, is attended with little inconvenience. Now since salt water contracts and gives off its heat till reduced much below the freezing point of fresh water, a salt lake would continue to part with its heat during the whole winter, mitigating it is true the intensity of the cold, but in spring perhaps the temperature of the whole body of water would be lower than the freezing point of fresh water. This body of ice cold water, would, during the spring, and perhaps through the summer, rob the atmosphere of its heat and render the climate in its neighborhood cold and unproductive.

While I am upon this subject, I will mention a circumstance which has to some appeared to be mysterious, and that is the often sudden disappearnce of the ice from our lake in the spring. It has, I believe, sometimes been the case, that the ice on the lake

has been considered good at night, and the lake entirely clear from ice in the morning. Some suppose the ice must have sunk. But that is not the fact.

Now the view of the subject which I have presented you affords an easy solution of this difficulty. The water under the ice, being considerably warmer than the ice, is continually dissolving it upon the underside after the weather becomes so mild that new ice ceases to form, and before the lake breaks up the ice usually becomes spongy and soft, so that when a rent is made in it, and the wind is high, the agitation of the water, which is so much warmer, causes it to dissolve and disappear in the course of a very few hours.

But to return to the ocean. It is a well established fact that there are in the ocean, currents moving in different directions. At the equator, the currents set generally to the westward in consequence of the action of the Trade Winds. But north of the equator, the direction of the currents is usually northward. The Gulf Stream, which comes from the Gulf of Mexico and passes along the coast of the United States, is an example. There is likewise a current setting northward all along the coast of Norway. And indeed it is probable from the constitution of things that the waters which are at the surface of the ocean are generally moving from the equator towards the poles, while those at the bottom of the ocean are moving in an opposite direction. This motion might be inferred, if we had no other proof, from the combined influence of heat and the rotation of the earth on its axis. Since the coldest waters are the heaviest, and lie at the bottom of the ocean in high latitudes, and those which are warmest occupy the surface at the equator, the tendency of the motion of the earth would be, to throw the heavier waters towards the equator along the bottom of the ocean, while the warmer and lighter waters moved along the surface towards the poles, where, after giving off their heat in the colder regions, they would sink to supply the place of those waters which are moving in the opposite direction. But we are not obliged to rely upon this theoretic view of the subject. We can appeal to facts; for it has been found by experiments at several places, that waters taken from great depths in the ocean are colder than the mean annual temperature of those places; and in some places it has been found to be colder than the greatest cold ever known in the atmosphere at those places. The inference is unavoidable,

that these waters must have come from colder regions. I will mention a few examples.

On the 20th of June, in lat. 67 deg. where the mean annual temperature is 39 deg., when the temperature of the atmosphere was 48½ deg., that of the water at the depth of 4680 feet was 26 deg., or six deg. below the freezing point. On the 31st of August, in lat. 69 deg., where the annual temperature is 38 deg., that of the air being 59½ deg., that of the water at the depth of 4038 feet was 32 deg. At the tropic, where the change of temperature is not more than seven or eight deg. during the year, at the depth of 3600 feet, the temperature of the water was found to be only 53 deg., while that of the air was 84 deg., making a difference of 31 deg.

These facts are sufficient to prove that the waters of cold regions are flowing towards the equator at the bottom of the ocean, and that being the case, the warm water at the surface must move in the opposite direction to supply their place. Thus we see that our beneficent Creator has made the ocean an important instrument, both in abating the heat of the torrid, and mitigating the cold of the polar, regions.

I would mention one other circumstance before leaving this subject. Navigators have uniformly found the ice to present a barrier to their progress both towards the north and south, about the 71st degree of latitude, excepting between Europe and America. Here they can often reach the 81st, or even the 82d degree of north latitude. And how shall we account for this phenomenon? The cause is undoubtedly to be sought for in the influence of the Gulf Stream. The Gulf Stream is formed principally of the waters which are put in motion towards the west by the Trade Winds. Being checked in their progress by the continent of America, they pass off northwesterly through the Carribean Sea into the Gulf of Mexico, where they are accumulated, and having no other way of escape, they flow out between Cuba and Florida, and take a northeasterly course along the coast of the United States, conveying immense quantities of warm water into the cold regions of the north, and thereby preventing the encroachments of ice into the southern parts of the Arctic Sea. It is rendered certain that the waters from the torrid zone pass by Great Britain and along the western coasts of Norway, from the fact that they convey thither seeds and vegetables which grow only in the West Indies. Not many years since, the wreck of an English vessel, which had been burnt near Jamacia, was found on the western coast of Scotland. The Gulf

Stream, from its direction and the course of the winds which blow over it, probably contributes more than any thing else to render the climate of Europe milder than that of any other part of the globe in the same latitude.

It is, I believe, pretty well ascertained, that the mean temperature of places south of the equator, or in south latitude, is colder than that of places in the same latitude north of the equator. There are two causes which contribute to this, and which I will briefly mention. And, first—the sun is, during the year, about eight days longer on the north side of the equator, than he is on the south side. This is owing to the elliptical form of the earth's orbit and to the earth's unequal motion in her orbit. The effect, however, of this is probably nearly counterbalanced by the earth being nearer the sun at the time the sun is on the south side of the equator. The other, and probably the more important one is the direction of the currents of the ocean. Nearly all the waters which are driven westward by the Trade Winds across the Atlantic, strike the continent of America to the northward of Cape St Roque, where the form of the coast is such as to give almost the whole current of warm waters between the tropics a northwesterly direction into the Gulf of Mexico. I think this circumstance alone may be sufficient to occasion a perceptible difference between the temperature of the northern and southern climates.

ORIGIN OF THE WAR BETWEEN THE IROQUOIS AND CANADIAN INDIANS.

It will be recollected by those who are acquainted with the early history of America, that a most destructive war was raging between the Iroquois, and the Algonquins and other Canadian Indians, when this part of the country was first visited by Champlain in 1603, and which continued for more than a century afterwards. The following account of the origin of that war was given by Charlevoix in 1720.

The Algonquins possessed all that extent of country which is from Quebec, and perhaps also from Tadousac quite to the lake of Nipissing, following the north shore of the river St Lawrence, and going up the great river which runs into it above the isle of Montreal. By this we may judge that this nation was then very numerous; and it is certain, that for a long time it made a very great

figure in this part of America, where the Hurons were alone in a condition to dispute with them the pre-eminence over all the rest. For the chase they had no equals, and for war they acknowledged no superiors. The few who remain to this day, have not degenerated from the ancient merit of this nation, and their misfortunes have not yet lessened their reputation. The Iroquois had made with them a kind of confederacy, very useful to both sides; but which in the opinion of the savages, amongst whom a great hunter and a great warrior are equally esteemed, gave the Algonquins a real superiority over the Iroquois. The latter, almost wholly employed in the culture of the lands, had engaged to give part of their harvest to the Algonquins; who on their side, were to divide with them the fruit of the chase, and to defend them against whoever should undertake to disturb them. The two nations lived thus a long time in a good understanding; but an ill timed haughtiness on one side, and a resentment, which was not expected on the other side, broke this union, and made a quarrel between these two people that hath been never reconciled.

As winter is the great season for the chase, and that the earth, then covered with snow, gives no employment to them who cultivate it, the two confederate nations joined together to winter in the woods; but the Iroquois commonly left the chase to the Algonquins, and contented themselves with flaying the beasts, drying the flesh, and taking care of the skins. This is at present every where the work of the women—perhaps then it was not the custom; however, the Iroquois made no difficulty of it. From time to time, however, some of them took a fancy to try themselves in the chase, and the Algonquins did not oppose it, in which they were bad politicians.

It happened one winter, that a troop of both nations stopped in a place where they expected plenty of game, and six young Algonquins, accompanied with as many Iroquois of the same age, were detached to begin the chase. They presently discovered some elks, and they all prepared themselves directly to pursue them; but the Algonquins would not suffer the Iroquois to follow them, and gave them to understand that they would have enough to do to flay the beasts they should kill. Unfortunately for these boasters, three days passed without their being able to bring down a single original, though a great number came in sight. This bad success mortified them, and probably was no displeasure to the

Iroquois, who earnestly desired to obtain leave to go another way, where they hoped to be more successful. Their proposal was received by the Algonquins, as was formerly that by the brothers of *David*, which the young shepherd made to go and fight with the giant *Goliah:* they told them that they were very vain to pretend to have more skill than the Algonquins; it was their business to dig the earth, and that they should leave the chase to those that were fit for it. The Iroquois enraged at this answer, made no reply; but the next night they departed privately for the chase. The Algonquins were surprised in the morning at not seeing them, but their surprise was soon changed into extreme vexation; for in the evening of the same day, they saw the Iroquois returning loaded with the flesh of originals. There are no men in the world who are more susceptible of spite, and who carry the effects of it further: the result of that of the Algonquins was sudden: the Iroquois were no sooner asleep than they were all knocked on the head. Such an assassination could not be long a secret; and tho' the bodies were buried privately, the nation was soon informed of it. At first they complained with moderation, but insisted on having the murderers punished. They were too much despised to obtain this justice: the Algonquins would not submit to make even the least satisfaction.

The Iroquois in despair made a firm resolution to be revenged for this scornful treatment, which irritated them more than the assassination of which they complained. They swore they would all die to the last man, or have satisfaction: but as they perceived themselves not in a condition to cope with the Algonquins, whose name alone kept almost all the other nations in awe, they departed from them a great distance, to make a proof of their arms against less formidable enemies, which they did by way of diversion; and when they thought themselves sufficiently inured to war, they fell suddenly on the Algonquins, and began a war of which we only saw the end, and which set all Canada in a flame. It was continued on the side of the Iroquois with a fierceness so much the more terrible, as it was the more deliberate, and had nothing of that precipitate fury which hinders measures from being well taken. Moreover, the savages do not think themselves thoroughly revenged but by the utter destruction of their enemies, and this is still truer of the Iroquois than of the rest. They say commonly of them, that they come like foxes, they attack like lions, and fly away like birds.

METEOROLOGICAL

BURLINGTON, Vt., Lat. 44° 27′. Long. 73° 14′. Altitude above Lake

1832.		*Thermometer.*			*Barometer.*			RAIN	*Winds.*		
SEPT.		S. R.	1 P.M.	9 EV.	S. R.	1 P.M.	9 EV.	Inch's	Morning.	Noon.	Evening.
1	7	47	62	53	29.45	29.40	29.40		N.	N. W.	N. W.
2	G	43	64	58	29.55	29.40	29.25		N.	N.	N.
3	2	48	75	65	29.35	29.15	29.10		S.	S.	S.
4	3	62	62	62	29.00	29.00	28.90		S″.	S″.	S′
5	4	50	60	54	28.75	29.00	29.15	.48	S″.	S.W.	W′.
6	5	51	65	51	29.25	29.20	29.20		W.	W.	W.
7	6	51	69	60	29.15	28.85	28.95		S′.	S.	S.
8	7	49	68	60	29.20	29.10	29.10		W.	S.	S′.
9	G	51	58	49	29.35	29.40	29.50		W.	W.	W.
10	2	38	65	57	29.75	29.45	29.40		N. W.	S′.	S′.
11	3	58	66	68	29.25	29.00	28.85		S″.	S″.	S′.
12	4	57	57	50	29.00	29.20	29.40	.56	S. W.	N. W.	N. W.
13	5	44	51	47	29.55	29.50	29.55		N. W.	N. W.	N. W.
14	6	36	66	56	29.65	29.40	29.35		S. W.	S′.	S′.
15	7	58	71	64	29.30	29.00	29.00		S′.	S″.	S.
16	G	57	70	62	29.25	29.15	29.20		N.	N.	N.
17	2	54	74	64	29.40	29.30	29.40		N.	N.	N.
18	3	51	75	66	29.60	29.30	29.35		N.	S.	S.
19	4	61	82	69	29.35	28.95	29.10		S.	S.	S.
20	5	58	80	71	29.15	28.90	28.90		S.	S.	S.
21	6	64	71	64	28.90	28.80	28.95		S.	S.	S.
22	7	61	68	54	28.90	28.90	28.95	.54	E.	S.	N. W.
23	G	49	61	53	29.30	29.30	29.35	.23	W.	W.	W.
24	2	45	66	56	29.45	29.10	29.00		S.	S.	S′.
25	3	47	58	52	28.95	29.10	29.25		S″.	S′.	S′.
26	4	49	66	54	29.45	29.20	29.35		W.	S.	S.
27	5	52	72	62	29.35	29.15	29.20		S.	S.	S.
28	6	60	72	62	29.20	29.05	29.15		S.	S.	S.
29	7	60	75	64	29.20	28.90	28.90		S.	S.	S.
30	G	56	62	60	28.90	29.00	29.00		N.	N.	N.
MEAN		52.8	64.4	58.9	29.26	29.14	29.17	1.81	Gen'l mean Ther. 58.7		

JOURNAL.

Champlain 250 feet. Distance from the Lake, one mile East.

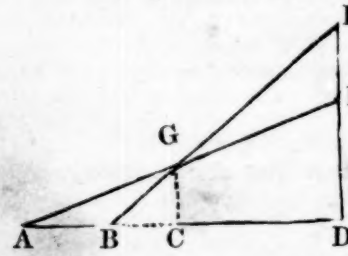
Weather.				Remarks.
D.	Morn.	Noon.	Even'g.	
1	*Fair*	*Clear*	*Clear*	Some foggy.
2	*Clear*	*Clear*	*Clear*	Heavy dew.
3	*Clear*	*Clear*	*Clear*	
4	*Cloudy*	*Cloudy*	*Rain*	
5	*Fair*	*Fair*	*Fair*	
6	*Cloudy*	*Clear*	*Fair*	
7	*Fair*	*Clear*	*Fair*	
8	*Clear*	*Clear*	*Fair*	Very smoky.
9	*Fair*	*Fair*	*Clear*	
10	*Clear*	*Clear*	*Clear*	Frost in many places.
11	*Fair*	*Cloudy*	*Cloudy*	Lightning in the evening.
12	*Fair*	*Fair*	*Fair*	
13	*Fair*	*Clear*	*Clear*	
14	*Clear*	*Clear*	*Clear*	Considerable frost.
15	*Rain*	*Fair*	*Clear*	
16	*Clear*	*Clear*	*Clear*	Northern Lights. Lightning.
17	*Cloudy*	*Clear*	*Clear*	Very smoky.
18	*Clear*	*Clear*	*Clear*	Very smoky.
19	*Clear*	*Clear*	*Clear*	Smoky. Heavy dew.
20	*Clear*	*Clear*	*Clear*	Smoky.
21	*Clear*	*Cloudy*	*Rain*	Smoky.
22	*Cloudy*	*Fair*	*Rain*	Fog on the lake.
23	*Clear*	*Clear*	*Clear*	
24	*Clear*	*Clear*	*Clear*	
25	*Cloudy*	*Cloudy*	*Cloudy*	
26	*Fair*	*Clear*	*Clear*	
27	*Fair*	*Clear*	*Clear*	
28	*Cloudy*	*Clear*	*Clear*	
29	*Clear*	*Clear*	*Fair*	
30	*Cloudy*	*Cloudy*	*Cloudy*	Very foggy and smoky all day.

Barometer, 29.19 inches.

Additional Remarks.—By the foregoing table, it appears that the mean temperature of September of this year, was 58.7 degs., which is 2.1 degs. colder than September, 1828; and 1.6 degs. warmer than the mean of Doct. Saunders' observations. Range of the Thermometer, from 36 to 82 degs., equal to 46 degrees. Range of the Barometer, from 28.75 to 29.75 inches, equal to one inch.

Three slight frosts during August and September, but not severe enough to kill the tenderest vegetables in this neighborhood.—September has been dryer than any preceding month in the year.

Solution of the question in No. 8.



A B=5 yds.
C D=12 "
D E=3.5 "
D F= 6 "
} By the question.

Here A is the first station, B the second, C G the height of the window, C D the width of the street=12 yards, D E=42 courses of bricks=3.5 yds. and D F=72 courses=6 yds. Putting x=C G and y=B C, we have $5+y : x :: 5+y+12 : 3.5$, in which it will be found $y=\frac{17x-17.5}{3.5-x}$; and again, $y : x :: y+12 : 6$, in which it will be found $y=\frac{12x}{6-x}$. Taking these two values of y, we have $\frac{17x-17.5}{3.5-x}=\frac{12x}{6-x}$ which cleared of fractions, stands, $x^2-15.5x=-21$, in which, by completing the square, extracting the root, &c. it will be found x=1.5 yard, the height of the window, which was required. By this value of x, y is readily found to be 4 yards.

Question.—A person began trade with a certain sum, and at the end of three years he had just doubled it: the next year, he gained the square root of that doubled sum and ten dollars more: and the next three years, he doubled the whole, when he had 62,500 dollars. How much had he when he begun?

SUMMARY.

A Silver Mine, said to be the richest in America, has recently been discovered in Chili.

Iron Ore.—A valuable bed of Iron ore has recently been discovered on the eastern part of Brandon, or western part of Goshen in this state. It yields more than 50 per cent of iron, which is said to possess all the properties of good steel.

Mr Henry Bowen, of Boston, has manufactured a permanent die for cloth, which has sufficient consistency to be used as printing ink. With this he has commenced printing upon bleached cotton, with a common printing press and types.

We understand, (says the Boston *Atlas*,) that a gentleman of this city has lately given five thousand dollars to Yale College, and five thousand to Harvard University.

A wrought-iron steamboat has just been completed for the East India Company, and is intended for towing vessels into the river Ganges. Her length is 125 feet, breadth 24, and between decks 11. The whole is of iron, except the deck, which is of plank. The iron is half an inch thick, in large plates, and fastened by 30,000 curiously contrived rivets. The engine is 60 horse power, and it is calculated that she will not draw above 1 foot 11 inches of water. It seems there is some worm or insect in the Ganges that speedily destroys the wooden steamers, which has led to this novel expedient, at the cost of some £20,000. The vessel will be launched to-day near Westminster bridge.—*Lit. Gaz.*

Canal from the Nile to the Red Sea.—According to the estimates made by some distinguished French engineers, the whole expense of a deep canal which should connect the Arabic gulf with the Nile and the Mediterranean, make Africa an island, and shorten the voyage from Marseilles to Bombay one half, would not exceed £700.000.

NEGRO PROVERBS.

When you saw the palm tree, the palm tree had seen you before.

The child looks all around and sees nothing; the old man sits on the ground and sees every thing.

If the small measure only goes to the store, the millet will last long.

The house roof fights with the rain; he who is under shelter does not know it.

Not to know is bad; not to ask is worse.

If you well understand the beginning, you need not trouble yourself about the end.

He who sells bones, has no business in the other world.

Were it not for the fingers the hand would be a spoon.

The frog loves to be in water, but not in *hot* water.

The woman whose rival is dead does not mourn.

Deny, if you please; but if you see, believe.

Truth, if it rises, will overreach lies, however numerous.

The partridge loves pease, but not those that go with her into the pot.

A razor cannot shave itself.

If you tread on the serpent, nobody will say let him alone.

Where the mouse laughs at the cat, there is a hole.

It you don't stay at home, you will have no work.

The sky is the king of roofs; the night is the queen of shade; the earth is the queen of beds; the sun is the king of candles.

POETICAL DEPARTMENT.

ON THE DEATH OF THE INFIDEL POET SHELLEY.

BY BARNARD BARTON.

With those who think they view in thee
The champion of their creed,
If theirs in truth a creed may be.
Who from belief are freed,—
Who view with scorn all modes of faith,
Though sealed by many a martyr's death,
With such I fain would plead;
And, in that love which knows no bound,
Once more a brief alarm would sound.

If Christians err, yourselves admit
Such errour harms them not;
If you are wrong, and Holy Writ
No juggling, priestly plot,
But truth's own Oracle reveal'd;—
Then is your condemnation seal'd,
And hopeless is your lot!
You *doubt* the Gospel;—keep in view,
What *can be doubted—may be true!*

But O! to *you*—who halt between
The Christian's—skeptic's part;
Who now to Revelation lean,
And now to sophist's art;
As one who many doubts has known,—
Aware what convicts like your own
Awaken in the heart:—
This simple watchword let me give:
"*Believe!—Obey!—and ye shall live!*"

SPECIMEN OF ALLITERATION.

The following is probably the most perfect specimen of *Alliteration* extant. Whoever has at any time attempted to indite an *acrostic* merely, is aware of the embarrasment of being confined to particular initial letters. Here the whole *alphabet* is fathomed, and each word, in each line, claims its own proper initial. It is worthy the indefatigable perseverance of another Dean Swift.—*Boston Centinel*

Siege of Belgrade.

"An Austrian army, awfully arrayed,
Boldly, by battery, besieged Belgrade,
Cossack commanders cannonading come,—
Dealing destruction's devastating doom;
Every endeavour, engineers essay,
For fame, for fortune,-fighting furious fray:
Generals 'gainst generals grapple—gracious God!
How honors Heaven, heroic hardihood!
Infuriate,—indiscriminate in ill,
Kinsmen kill kinsmen-kinsmen kindred kill:
Labor low levels loftiest, longest lines—
Men march 'mid mounds, 'mid moles, 'mid murd'rous mines:
Now noisy noxius numbers notice nought
Of outward-obstacles opposing ought:
Poor patriots, partly purchased, partly pressed,
Quite quaking, quickly quarter, quarter 'quest:
Reason returns, religious right redounds,
Suwarrow stops such sanguinary sounds,
Truce to the Turkey—triumph to thy train!
Unjust, unwise, unmerciful Ukraine!
Vanish vain victory, vanish victory vain!
Why wish we warfare? Wherefore welcome were
Xerxes, Xymenes, Xanthus, Xaviere?
Yield! ye youths! ye yeomen, yield your yell!
Zeno's, Zarpater's, Zoraster's, zeal,
And all attracting—arms against appeal."

From the Charleston Courier.

PENITENCE.

If thou coulds't know what 'tis to weep,
To weep unpitied and alone
The live-long night, whilst others sleep,
Silent and mournful watch to keep,
Thou would'st not do what I have done.

If thou could'st know what 'tis to smile,
To smile, whilst scorn'd by every one,
To hide by many an artful wile,
A heart that knows more grief than guile,
Thou would'st not do what I have done.

And oh! if thou could'st think how drear,
When friends are chang'd and health is gone,
The world would to thine eyes appear;
If thou, like me, to none wert dear,
Thou would'st not do what I have done.

HYMN.

From poems for youth by a family circle.

Frail tho' my young devotions be,
I humbly dare look up to thee,
My Father and my God!
For I have felt affliction's power,
And yet in sorrow's darkest hour,
Have marked a parent's rod.

I pray not for this world's vain hope,
The soul desires a larger scope,
Destined to live for ever:
I ask not many years to live,
But that in those thou will'st to give,
I may forget thee never.

In every varying moment still
May my whole duty be thy will,
And may I meet each trial,
With fortitude resign'd and pure,
A spirit anchored to endure,
And holy self-denial.